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BEVER, HOFFMAN & HARMS, LLP
2099 GATEWAY PLACE
SUITE 320
SAN JOSE, CA 95110

EXAMINER	
CRAIG, DWIN M	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/683,923	**Applicant(s)** TOMA ET AL.	
	Examiner Dwin M. Craig	**Art Unit** 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-25 and 35-50* is/are allowed.

6)☒ Claim(s) *1,4-6,9,26,29-31 and 34* is/are rejected.

7)☒ Claim(s) *2,3,7,8,27,28,32 and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.	6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-25 have been presented for reconsideration based on the instant amendments to the claims and Applicants' arguments, Claims 25-50 have been presented for Examination.

Response to Arguments

2. Applicants' arguments presented in the 5/24/2007 responses have been fully considered; the Examiner's response is as follows:

2.1 Regarding the Applicants' response to the 35 U.S.C. 101 rejections of claims 1-25, the Examiner has found Applicants' arguments in combination with the instant amendments to the claims to be persuasive and hereby withdraws the previously applied 35 U.S.C. 101 rejections of claims 1-25. Regarding Applicants' arguments concerning claims 26, 31, 35 and 43, Applicants' argued on page 14 of the 5/24/2007 responses that;

> Applicant respectfully submits that the recited optimized size and wait period that are provided to a simulator to minimize simulation time is a useful, tangible, and concrete result achieved by the claimed invention. Based on the above clarifications, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claims 26, 31, 35, and 43.

The Examiner respectfully points out to the Applicants' that these claims are being presented for the first time and have not been rejected under 35 U.S.C. 101, therefore there is no need to withdraw any rejections of these claims. Further and in regards to the newly presented independent claims 26, 31, 35 and 43, these newly presented claims appear to claim statutory subject matter and as such will not be rejected under 35 U.S.C. 101.

2.2 Regarding Applicants' response to the 35 U.S.C. 103 rejections of claims 1, 4, 5, 6 and 9, on page 15 Applicants' argued;

> Applicant respectfully submits that neither Schaumont nor Sevalia disclose or suggest the recited dynamic FIFO. The First Office Action states that Schaumont fails to teach a dynamic FIFO that can increase in size. Applicant notes that Schaumont can increase the storage of a queue when the default length (16) is exceeded by put (i.e. a write operation into the queue), but only by a factor of 2. Col. 13, lines 26-29. Notably, **this doubling of storage is not based on a wait period (configurable).** Because Schaumont cannot configure the wait period, either the final queue size of Schaumont will be quite large (i.e. significantly larger than that provided by the recited FIFO) or the whole design may crash due to size overflow.

The Examiner respectfully traverses Applicants' arguments, there is no requirement that the prior art recites that the FIFO change its' size due to a *wait period* only that the size of the FIFO be flexible, that it is changed based on a wait period speaks to an intended use of a flexible FIFO, the FIFO as disclosed in *Selvaila* is a flexible FIFO, see Col. 2 lines 39-60 more specifically, "...The circuit **100** may implement an architecture having a multiport, flexible FIFO that may be scalable to different widths (e.g. a, b, c and d) and depths (e.g. A, B, C, and D)..." at the time the invention was made it could have been obvious, to an artisan of ordinary skill, to have provided for a variable FIFO between two logic blocks to be have the FIFO's size changed based on a wait period because the relative processing speed of one logic block might be different from the speed of another logic block and the FIFO could need to be adjusted to accommodate the difference in the processing data pipelines of the two logic blocks, see *Dann v. Johnson,* 425 U.S. 219, 189 USPQ 257 (1976) and *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.* –F.3d--, 82 USPQ2d 1687 (Fed. Cir. 2007) and *KSR International Co. v. Teleflex Inc.,* 550 U.S. --,82 USPQ2d 1385 (2007).

On page 15 Applicants' argued ;

> Sevalia teaches a multi-port FIFO with programmable width and depth that is **provided on a chip.** Col. 1, lines 6-8 and col. 5, lines 9-12. As correctly indicated by the Examiner, the **dynamic FIFO is not an actual memory circuit implemented in silicon. As clarified by Applicant, an optimized size of the dynamic FIFO in the simulation environment determines an optimized FIFO memory size for a silicon implementation.** Thus, the recited dynamic FIFO eliminates the need for the large block of memory (see, e.g. col. 2, lines 42-45) as well as programmability of the FIFO when it is implemented in silicon. Applicant notes that Sevalia also fails to teach anything about automatically increasing the size of the FIFO based on a configurable wait period.

The Examiner respectfully traverses Applicants' arguments, there is no requirement that the prior art recites that the FIFO change its' size due to a *wait period* only that the size of the FIFO be flexible, that it is changed based on a wait period speaks to an intended use of a flexible FIFO, the FIFO as disclosed in *Selvaila* is a flexible FIFO, see Col. 2 lines 39-60 more specifically, "...The circuit **100** may implement an architecture having a multiport, flexible FIFO that may be scalable to different widths (e.g. a, b, c and d) and depths (e.g. A, B, C, and D)..." at the time the invention was made it could have been obvious, to an artisan of ordinary skill, to have provided for a variable FIFO between two logic blocks to be have the FIFO's size changed based on a wait period because the relative processing speed of one logic block might be different from the speed of another logic block and the FIFO could need to be adjusted to accommodate the difference in the processing data pipelines of the two logic blocks, see *Dann v. Johnson,* 425 U.S. 219, 189 USPQ 257 (1976) and *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.* –F.3d--, 82 USPQ2d 1687 (Fed. Cir. 2007) and *KSR International Co. v. Teleflex Inc.,* 550 U.S. --,82 USPQ2d 1385 (2007).

2.3 The previously applied prior art rejections will be maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 4, 5, 6, 9, 26, 29, 30, 31 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,606,588 to Schaumont in view of U.S. Patent 6,526,495 to Sevalia.

3.1 Regarding claims 1, 6, 26 and 31 and using claim 1 as an example, *Schaumont* teaches, *a simulation environment with a time component, the simulation environment comprising: a first unit that produces data; a second unit for consuming the data; and a first-in first-out buffer (FIFO) that interfaces between the first unit and the second unit* (Figure 2 and Figure 21 and Col. 12 lines 30-38 and Col. 69 lines 56-57 and Col. 70 lines 42-44).

However, *Schaumont* does not expressly disclose, *a dynamic first-in first-out buffer (FIFO) that interfaces between the first unit and the second unit, the dynamic FIFO capable of automatically increasing its size to minimize deadlock.*

Selvalia teaches *a dynamic FIFO capable of automatically increasing its size to minimize deadlock* (Figures 1-8 and Col. 2 lines 39-60).

Scaumont and *Selvalia* are analogous art because they are both from the same problem solving area of controlling data flow between different modules using FIFOs.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to have used the dynamic FIFO of *Selvalia* with the simulation environment of *Schaumont*.

The motivation for doing so would have been the ability of using a flexible FIFO design to accommodate different demands on dataflow within a design during simulation and testing and using the FIFO design of *Selvalia* allows for improvements in cost and packaging (see *Selvalia* Col. 1 lines 16-22).

Further and inregards to the newly amended limitation that the FIFO changes sized based on a *wait period* there is no requirement that the prior art recites that the FIFO change its' size due to a *wait period.* The prior art presented provides that the size of the FIFO is flexible, that it is changed based on a wait period speaks to an intended use of a flexible FIFO, the FIFO as disclosed in *Selvaila* is a flexible FIFO, see Col. 2 lines 39-60 more specifically, "...The circuit **100** may implement an architecture having a multiport, flexible FIFO that may be scalable to different widths (e.g. a, b, c and d) and depths (e.g. A, B, C, and D)..." at the time the invention was made it could have been obvious, to an artisan of ordinary skill, to have provided for a variable FIFO between two logic blocks and to be have the FIFO's size changed based on a wait period because the relative processing speed of one logic block might be different from the speed of another logic block and the FIFO could need to be adjusted to accommodate the difference in the processing data pipelines of the two logic blocks, see *Dann v. Johnson,* 425 U.S. 219, 189 USPQ 257 (1976) and *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.* –F.3d--, 82 USPQ2d 1687 (Fed. Cir. 2007) and *KSR International Co. v. Teleflex Inc.,* 550 U.S. --,82 USPQ2d 1385 (2007).

Therefore, it would have been obvious to combine *Selvalia* with *Schaumont* to obtain the invention as specified in claims 1, 4, 5, 6, 9, 26, 29, 30, 31 and 34.

3.2 Regarding claims 4, 5, 9, 29, 30 and 34 *Scaumont* teaches, *wherein the dynamic FIFO has a timing behavior substantially similar to that of the second unit* (Figure 2 and the descriptive text and Col. 9 lines 22-30 more specifically, "When the system also contains timed blocks, however, a cycle scheduler is used..." the cycle scheduler will ensure compatible timing between the FIFO and the second block).

Allowable Subject Matter

4. Claims 10-25 and 35-50 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

4.1 While *Schaumont* teaches, *a simulation environment with a time component, the simulation environment comprising: a first unit that produces data; a second unit for consuming the data; and a first-in first-out buffer (FIFO) that interfaces between the first unit and the second unit* and *Selvalia* teaches *a dynamic FIFO capable of automatically increasing its size to* *minimize deadlock*, and U.S. Patent 5,410,652 to Leach et al. teaches a FIFO control system that is governed by Tokens, see Figure 14 and the descriptive text, more specifically, Col. 43 lines 55-67 and Col. 44 lines 1-40, **none of these references taken either alone or in combination with the prior art of record disclose**, generating the tokens and adjusting the buffer or FIFO depth based specifically on the rate of consumption of the generated tokens, specifically including:

(claim 10) "...a first block of the design that generates a plurality of tokens, the second model representing the second block of the design that consumes the plurality of tokens based on the behavior..." and "...decreasing the wait period each time the dynamic memory is full and the second model does not request a token...",

(claim 18) "...the first model generating a plurality of tokens, the second model consuming the plurality of tokens based on behavior" and "means for decreasing the wait period each time the dynamic memory is full and the second model does not request a token...",

(claim 35) "...a first block of a design that generates a plurality of tokens, the second model representing a second block of the design that consumes the plurality of behavior..." and "...providing a dynamic memory for receiving the tokens, storing the tokens, and providing the tokens in an order output by the first model when requested by the second model..." and "...decreasing the wait period each time the dynamic memory is full and the second model does not request a token...",

(claim 43) "...the first model generating a plurality of tokens, the second model consuming the plurality of tokens based on a behavior" and "...means for handling the tokens including receiving the tokens, storing the tokens, and providing the tokens in an order output by the first model when requested by the second model" and "...means for decreasing the wait period each time the dynamic memory is full and the second model does not request a token", **in combination with the remaining elements and features of the claimed invention.** It is for these reasons that the Applicants' invention defines over the prior art of record.

4.2 Dependent claims 11-17, 19-35, 36-42 and 44-50 are allowed for at least the reason that they depend from an allowed base claim.

4.3 Claims 2, 3, 7, 8, 27, 28, 32 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4.4 Regarding claims 2, 7 , 27 and 32, the following is a statement of reasons for the indication of allowable subject matter:

While *Schaumont* teaches, *a simulation environment with a time component, the simulation environment comprising: a first unit that produces data; a second unit for consuming the data; and a first-in first-out buffer (FIFO) that interfaces between the first unit and the second unit* and *Selvalia* teaches *a dynamic FIFO capable of automatically increasing its size to minimize deadlock*, and U.S. Patent 5,410,652 to Leach et al. teaches a FIFO control system that is governed by Tokens, see Figure 14 and the descriptive text, more specifically, Col. 43 lines 55-67 and Col. 44 lines 1-40, **none of these references taken either alone or in combination with the prior art of record disclose**, *a FIFO does not increase its size until the conclusion of a wait period,* specifically including:

(claim 2) "...wherein the dynamic FIFO determines whether a wait period has expired before increasing its size...", (claim 7) "...wherein the dynamic FIFO determines whether a wait period has expired before increasing its size...",

(claim 27) "...wherein the dynamic FIFO determines whether a wait period has expired before increasing its size...",

(claim 32) "...wherein the dynamic FIFO determines whether a wait period has expired before increasing its size...", **in combination with the remaining elements and features of the claims from which claims 2, 7, 27 and 32 depend.**

4.5 Regarding claims 3, 8, 28 and 33, the following is a statement of reasons for the indication of allowable subject matter:

While *Schaumont* teaches, *a simulation environment with a time component, the simulation environment comprising: a first unit that produces data; a second unit for consuming the data; and a first-in first-out buffer (FIFO) that interfaces between the first unit and the second unit* and *Selvalia* teaches *a dynamic FIFO capable of automatically increasing its size to minimize deadlock*, and U.S. Patent 5,410,652 to Leach et al. teaches a FIFO control system that is governed by Tokens, see Figure 14 and the descriptive text, more specifically, Col. 43 lines 55-67 and Col. 44 lines 1-40, **none of these references taken either alone or in combination with the prior art of record disclose**, *automatically increasing a wait period if the FIFO's size is increased a specific number of time*, specifically including;

(claim 3) "...wherein the dynamic FIFO is further capable of automatically increasing the wait period if its size is increased a predetermined number of times...",

(claim 8) "...wherein the dynamic FIFO is further capable of automatically increasing the wait period if its size is increased a predetermined number of time...", (claim 28) "...wherein the dynamic FIFO is further capable of automatically increasing the wait period if its size is increased a predetermined number of times...",

(claim 33) "...wherein the dynamic FIFO is further capable of automatically increasing the wait period if its size is increased a predetermined number of times...", **in combination with the remaining elements and features of the claims from which claims 3, 8, 28 and 33 depend.**

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M. Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dwin McTaggart Craig
AU 2123

PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100